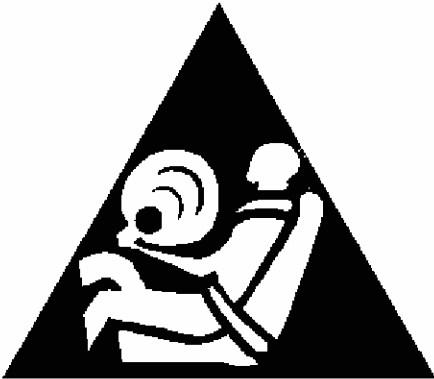


2006 ACCESSORIES & EQUIPMENT**Cruise Control - Lucerne****SCHEMATIC AND ROUTING DIAGRAMS****CRUISE CONTROL SCHEMATIC ICONS****Cruise Control Schematic Icons**

Icon	Icon Definition
	<p>CAUTION:</p> <p>When performing service on or near the SIR components or the SIR wiring, the SIR system must be disabled. Refer to <u>SIR Disabling and Enabling</u> . Failure to observe the correct procedure could cause deployment of the SIR components, personal injury or unnecessary SIR system repairs.</p>

CRUISE CONTROL SCHEMATICS

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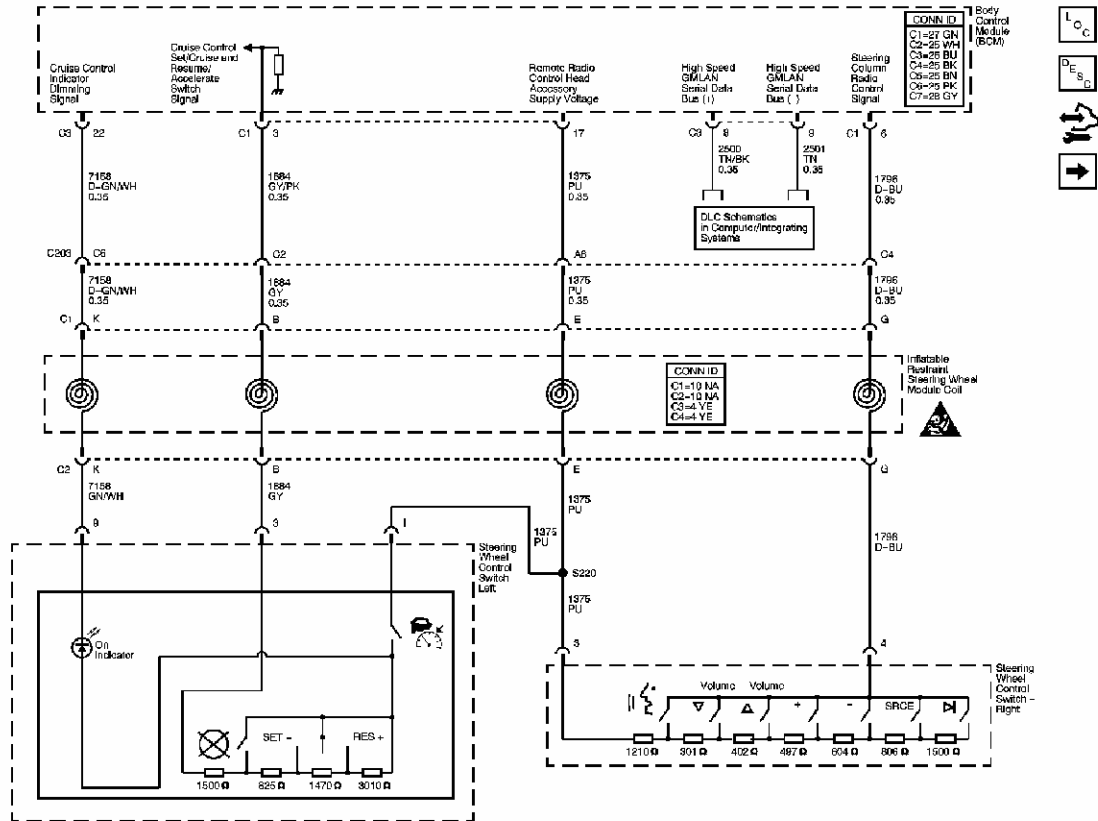


Fig. 1: Cruise Control ON/OFF Switch Schematic
 Courtesy of GENERAL MOTORS CORP.

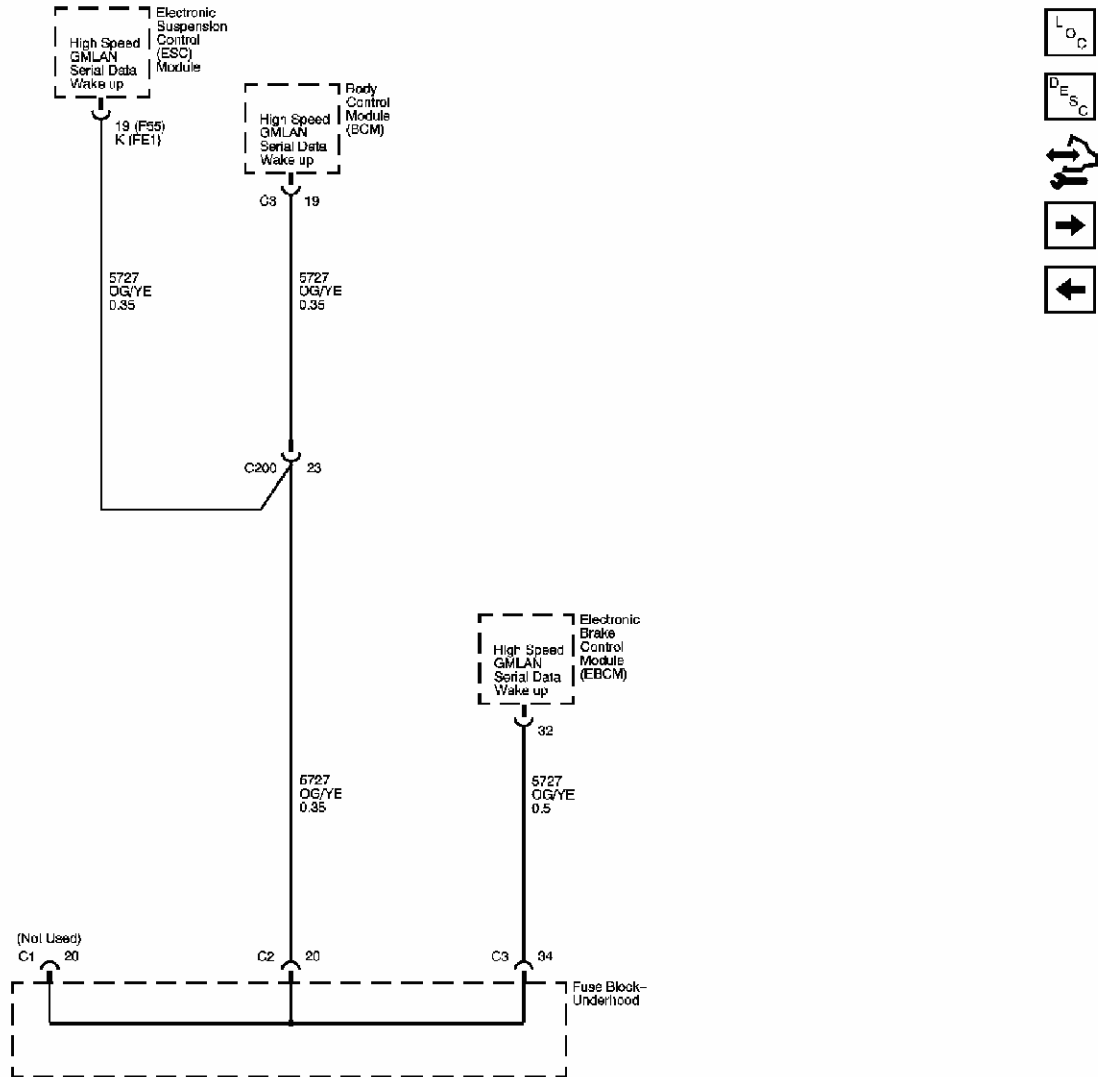


Fig. 2: Serial Data Wake Up Schematic
 Courtesy of GENERAL MOTORS CORP.

CRUISE CONTROL COMPONENT VIEWS

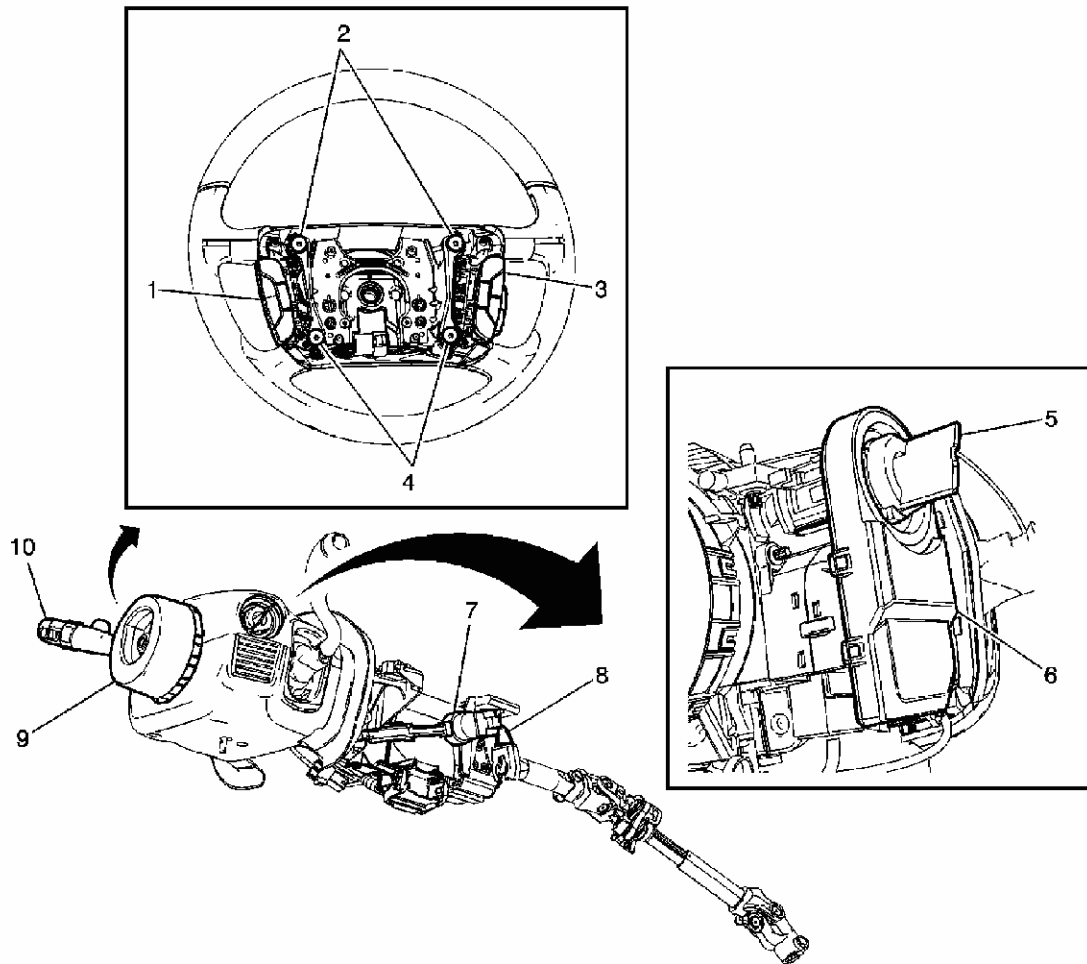


Fig. 4: View Of Steering Column Components
 Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 4

Callout	Component Name
1	Steering Wheel Control Switch - Left
2	Horn Switches
3	Steering Wheel Control Switch - Right
4	Horn Switches
5	Ignition Switch
6	Theft Deterrent Module (TDM)
7	Ignition Lock Cylinder Solenoid (A51)
8	Steering Angle Sensor (JL4)
9	Inflatable Restraint Steering Wheel Module Coil
10	Turn Signal/Multifunction Switch

Steering Wheel Control Switch - Left

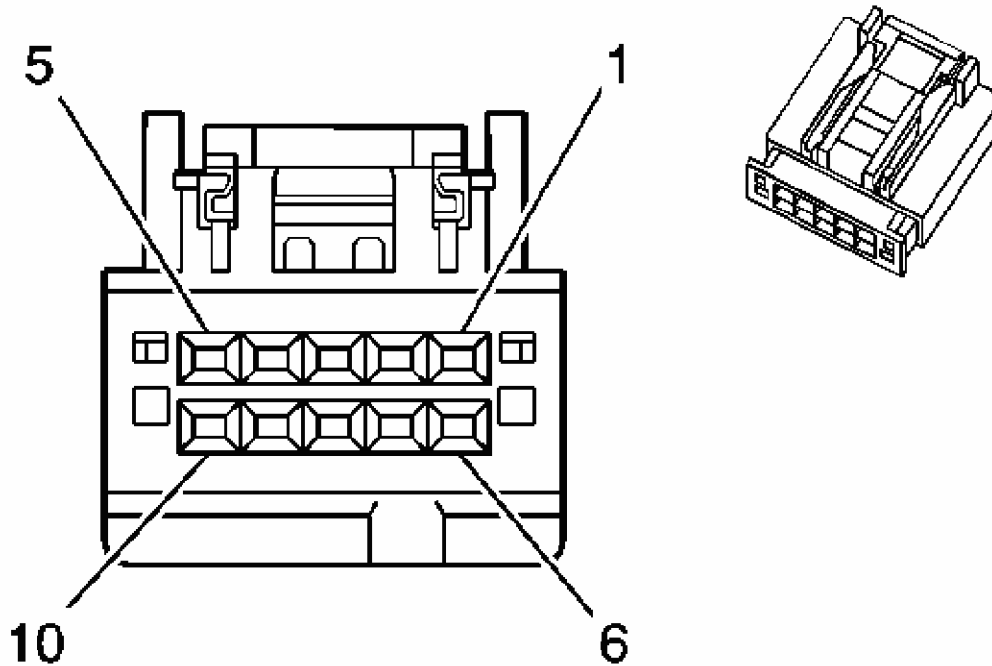


Fig. 5: Steering Wheel Control Switch Connector End View - Left
Courtesy of GENERAL MOTORS CORP.

Cruise Control Connector End Views

Connector Part Information

- OEM: 30700-1100
- Service: See Catalog
- Description: 10-Way F HDAC64 DR (BK)

Terminal Part Information

- Terminal/Tray: See Terminal Repair Kit
- Core/Insulation Crimp: See Terminal Repair Kit
- Release Tool/Test Probe: See Terminal Repair Kit

Steering Wheel Control Switch - Left

Pin	Wire Color	Circuit No.	Function
			Remote Radio Control Head

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Pin	Wire Color	Circuit No.	Accessory Supply Voltage	Function
2	-	-	Not Used	
3	GY	1884		Cruise Control Set/Cruise and Resume/Accelerate Switch Signal
4-5	-	-	Not Used	
6	PU/WH	1381		LCD Dimming Signal
7	-	-	Not Used	
8	BK	350		Ground
9	D-GN/WH	7158		Cruise Control Indicator Dimming Signal
10	-	-	Not Used	

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>DTC B3794</u>	Cruise Control Function Request Circuit
<u>DTC P0575</u>	Cruise Control Switch Signal Circuit
<u>DTC P0608</u>	Vehicle Speed Output Circuit
<u>DTC P0703</u>	Brake Switch Circuit 2
<u>DTC P1574</u>	Stop Lamp Switch Circuit
<u>DTC P2162</u>	Vehicle Speed Sensor (VSS) Circuit 1-2 Correlation

DIAGNOSTIC STARTING POINT - CRUISE CONTROL

Begin the system diagnosis with the **Diagnostic System Check - Vehicle** . The Diagnostic System Check will provide the following information:

- The identification of the control modules which command the system
- The ability of the control modules to communicate through the serial data circuit
- The identification of any stored diagnostic trouble codes (DTCs) and their status

The use of the Diagnostic System Check will identify the correct procedure for diagnosing the system and where the procedure is located.

SCAN TOOL DATA LIST

The scan tool data lists contain all of the cruise control related parameters that are available on the scan tool. The parameters in the list are arranged in alphabetical order. The data list

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column indicates the location of the parameter within the scan tool menu selections.

Use the scan tool data lists as directed by a diagnostic table or in order to supplement the diagnostic procedures. Begin all of the diagnostic procedures with **Diagnostic System Check - Vehicle**.

Use the scan tool data lists only after the following is determined:

- There is no published DTC procedure nor published symptom procedure for the customer concern.
- The DTC or symptom procedure indicated by the diagnostic system check does not resolve the customer concern.

The typical data values are obtained from a properly operating vehicle under the conditions specified in the first row of the scan tool data list table. Comparison of the parameter values from the suspect vehicle with the typical data values may reveal the source of the customer concern.

Body and Accessories - 3.8L

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: The ignition is ON/The engine is ON/The transmission is in Park or Neutral/The cruise control On/Off switch is OFF			
Cruise Control Active	PCM Data	Yes/No	No
Cruise Control Switch	BCM Data	Off/On/Error/Resume/Set/Cancel	Off
Cruise Disengage 1-6 History	PCM Data	The last reason for cruise control disengagement	Varies
Cruise On/Off Switch	PCM Data	On/Off	Off
Cruise Resume/Accel. Switch	PCM Data	On/Off	Off
Cruise Set/Coast Switch	PCM Data	On/Off	Off
Engine Speed	PCM Data	RPM	Varies
Ignition 1 Signal	PCM Data	Volts	Varies
Initial Brake Apply Signal	PCM Data	Applied/Released	Released
Moderate Brake Apply Signal	PCM Data	Applied/Released	Released
Stoplamp Pedal Switch	PCM Data	Applied/Released	Released
Stoplamp Pedal Switch Signal	PCM Data	Volts	Varies
TAC Stoplamp Pedal Switch	PCM Data	Applied/Released	Released

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Cruise Set/Cancel Switch	PCM Data	Active/Inactive	Inactive
Engine Speed	PCM Data	RPM	Varies
Vehicle Speed Sensor	PCM Data	km/h (mph)	Varies
Ignition 1 Signal	PCM Data	Volts	Varies

Body and Accessories - 4.6L

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: The ignition is ON/The engine is ON/The transmission is in Park or Neutral/The cruise control On/Off switch is OFF			
BPP Circuit Signal	ECM Data	Applied/Released	Released
Cruise Cancel Switch	ECM Data	Active/Inactive	Inactive
Cruise Control Active	ECM Data	Yes/No	No
Cruise Control Switch	ECM Data	Off/On/Error/Resume/Set/Cancel	Off
Cruise Disengage 1-8 History	ECM Data	The last reason for cruise control disengagement	Varies
Cruise On/Off Switch	ECM Data	On/Off	Off
Cruise Resume/Accel. Switch	ECM Data	Active/Inactive/Invalid	Inactive
Cruise Set/Coast Switch	ECM Data	Active/Inactive/Invalid	Inactive
Engine Speed	ECM Data	RPM	Varies
Ext. Travel BPP Signal	ECM Data	Applied/Released/Invalid	Released
Ignition 1 Signal	ECM Data	Volts	Varies
Vehicle Speed Sensor	ECM Data	km/h (mph)	0 km/h (0 mph)

Engine - 3.8L

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: The ignition is ON/The engine is ON/The transmission is in Park or Neutral/The cruise control On/Off switch is OFF			
Cruise Control Active	TAC Data	Yes/No	No
Engine Speed	TAC Data	RPM	Varies
Ignition 1 Signal	TAC Data	Volts	Varies
Initial Brake Apply Signal	TAC Data	Applied/Released	Released
Moderate Brake Apply Signal	TAC Data	Applied/Released	Released
Stoplamp Pedal Switch	TAC Data	Applied/Released	Released
TAC/PCM Communication Signal	TAC Data	OK/Fault	OK
TAC Stoplamp Pedal Switch	TAC Data	Applied/Released	Released

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Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
TAC Vehicle Speed Signal	TAC Data	OK/Fault	OK
Tractor Control Status	TAC Data	Active/Inactive	Inactive
Operating Conditions: The ignition is ON/The engine is ON/The transmission is in Park or Neutral/The cruise control On/Off switch is OFF			
Vehicle Speed Circuit History	Output Data	OK/Open/Short/Invalid	OK
Cruise Control Active	TAC Data	Yes/No	No
Vehicle Speed Circuit Status	TAC Data	OK/Fault/Invalid State	OK
Engine Speed	TAC Data	RPM	Varies
Vehicle Speed Sensor	TAC Data	km/h (mph)	0 km/h (0 mph)

Engine - 4.6L

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: The ignition is ON/The engine is ON/The transmission is in Park or Neutral/The cruise control On/Off switch is OFF			
BPP Circuit Signal	TAC Data	Applied/Released	Released
Cruise Control Active	TAC Data	Yes/No	No
Engine Speed	TAC Data	RPM	Varies
Ext. Travel BPP Signal	TAC Data	Applied/Released/Invalid	Released
Ignition 1 Signal	TAC Data	Volts	Varies
Reduced Engine Power	TAC Data	Yes/No	No
Vehicle Speed Sensor	TAC Data	km/h (mph)	0 km/h (0 mph)

SCAN TOOL DATA DEFINITIONS (DISENGAGE HISTORY)

One of the following conditions must be present in order for a disengagement parameter to appear:

- The Cruise Control System is active and disengagement is requested.
- The engagement of the Cruise Control System is requested while a fault is present.

Accel Rate

The engine control module (ECM) detects that the vehicle acceleration is greater than the calibrated cruise control threshold.

APP Override

The ECM detects that the accelerator pedal overrides the set vehicle speed for approximately 60 seconds.

Brake

The ECM detects that the stop lamps have been activated according to the brake pedal

position (BPP) sensor/stop lamp switch input from the platform module. Also, the brake pedal being applied according to the brake fluid pressure sensor input can also set this disengagement reason with vehicles equipped with the vehicle stability enhancement system (VSES).

BPP Data

The ECM detects an invalid brake pedal apply serial data message from the platform module.

BPP DTC

The ECM detects that DTC P0703 is active.

Cancel

The ECM detects that the cruise control cancel switch has been activated.

Clutch

The ECM detects that the clutch pedal switch has been activated.

Coast Disengage

When the ECM detects that the cruise set/coast signal is active and the throttle blade fully closes the cruise control system will disengage until the ECM detects that the set/coast signal is inactive. The cruise control system will then engage and set with the new vehicle speed.

Coast Speed Low

The ECM detects that the Set/Coast switch is activated until the vehicle speed is below 37 km/h (23 mph).

Cruise S/W

The ECM detects that a cruise control software execution error is present.

Cruise Sw Data

A fault in the serial data circuit from the cruise control switch to the platform module is detected.

Cruise Sw. Off

The ECM detects that the cruise On/Off switch was turned to OFF when the cruise control system was enabled.

D Whl Spd Low

The ECM detects the driven wheels are at a slower speed than the non-driven wheels.

D Whl Spd Hi

The ECM detects the driven wheels are at a faster speed than the non-driven wheels.

Decel Rate

The ECM detects that the vehicle deceleration is greater than the calibrated cruise control threshold.

DLC Override

The ECM detects that a DLC override has occurred.

DTC Set

The ECM detects that a DTC has been set which affects the cruise control operation.

ECM Inhibit

The ECM detects a RAM corruption associated to the cruise control system.

ECT Overtemp

The ECM detects the engine temperature is above the calibrated threshold.

Engine Run Time

The ECM detects that the cruise control system has been requested and the engine run time counter is not active.

Engine Speed

The ECM detects that the engine speed is less than or greater than a calibrated RPM.

First Gear

While the cruise control system is active, the ECM detects that the transmission is in Drive 1.

High Speed

The ECM detects that the vehicle speed is greater than the calibrated amount.

High Voltage

The ECM detects that the ignition voltage is above 16 volts.

Illegal Mode

The ECM detects that the acceleration mode is active without the activation of the Accel. switch.

Lost Fwd Gear

The ECM detects that transmission is in Neutral, Reverse or Park.

Low Speed

The ECM detects that the vehicle speed is less than 37 km/h (23 mph) while the cruise control system was enabled.

Low Voltage

The ECM detects that the ignition voltage is below 9 volts.

Memory DTC

The ECM detects an internal memory fault.

MPH Limit

The ECM detects the vehicle is over speed and that the fuel shutoff has been activated.

None

This parameter is displayed when a new ECM has been installed.

Over Set Speed

The ECM detects the current vehicle speed is greater than the set vehicle speed by more than a calibrated amount.

Park Brake

ECM detects the park brake switch is active.

Pedal Initialize

The ECM detects that a stop lamp pedal activation had not occurred before the cruise control system was requested.

PTO Active

The ECM detects power take off is active.

RPM Limit

The ECM detects the engine is over speed and that the fuel shutoff has been activated.

S/C On - Speed High

The ECM detects the Set/Coast switch is briefly applied while the current vehicle speed is greater than the set vehicle speed by more than a calibrated amount.

Simul SC/RA Sw

The ECM detects that the Set/Coast switch and the Resume/Accel switch are active at the same time.

Sw Invalid

The ECM detects the analog cruise control switch input is out of the normal voltage range.

TAC Inhibit

The ECM detects a fault within the throttle actuator control (TAC) system.

TCS

The ECM detects that the traction control system had been activated. It is also possible that a tire with low air pressure can also set this disengagement reason.

Trans. DTC

The ECM detects a transmission gear fault.

Under Set Speed

The ECM detects that the vehicle speed is less than the cruise memory speed by more than a calibrated amount.

VSES

The ECM detects that the vehicle stability enhancement system had been activated.

SCAN TOOL DATA DEFINITIONS (CRUISE CONTROL)

The Scan Tool Data Definitions contains a brief description of all cruise control related parameters available on the scan tool. On vehicles equipped with a 3.8L engine, a powertrain control module (PCM) is used. On vehicles equipped with a 4.6L engine, an engine control module (ECM) is used.

BPP Circuit Signal

The scan tool displays Applied or Released. This is the state of the BPP circuit as detected by the ECM.

Cruise Cancel Switch

The scan tool displays Active or Inactive. This is the state of the cruise cancel switch as detected by the ECM.

Cruise Control Active

The scan tool displays Yes or No. The ECM/PCM determines the current status of the cruise control operation. An operating cruise control system is displayed as Yes.

Cruise Control Switch (3.8L)

The scan tool displays Off/On/Error/Resume/Set. The body control module (BCM) monitors the cruise control set/coast and resume/accel switch signal circuit in order to determine the status of the cruise control switch.

Cruise Control Switch (4.6L)

The scan tool displays Off/On/Error/Resume/Set. The ECM monitors the cruise control set/coast and resume/accel switch signal circuit in order to determine the status of the cruise control switch.

Cruise Disengage (1-6) History

The scan tool displays the last 6 reasons why the cruise control system was disengaged. Refer to **Scan Tool Data Definitions (Disengage History)**.

Cruise Disengage (1-8) History

The scan tool displays the last 8 reasons why the cruise control system was disengaged. Refer to **Scan Tool Data Definitions (Disengage History)**.

Cruise On/Off Switch

The scan tool displays On or Off. This is the state of the cruise control On/Off switch as detected by the ECM/PCM. An active switch is displayed as On.

Cruise Resume/Accel. Switch

The scan tool displays Active, Inactive or Invalid. This is the state of the resume/accel switch as detected by the ECM. An active cruise resume/accel switch is displayed as Active.

Cruise Resume/Accel. Switch

The scan tool displays On or Off. This is the state of the resume/accel switch as detected by the PCM. An active cruise resume/accel switch is displayed as On.

Cruise Set/Coast Switch

The scan tool displays Active, Inactive or Invalid. This is the state of the cruise set switch as detected by the ECM. An active cruise set switch is displayed as Active. The cruise control On/Off switch must be On in order to view the parameter correctly.

Cruise Set/Coast Switch

The scan tool displays On or Off. This is the state of the cruise set switch as detected by the PCM. An active cruise set switch is displayed as On. The cruise control On/Off switch must be On in order to view the parameter correctly.

Engine Speed

The scan tool displays 0 to 9999 RPM. This is the engine RPM as monitored by the ECM/PCM. The ECM/PCM monitors the crankshaft position (CKP) signal circuit in order to determine the engine RPM.

Ext. Travel BPP Signal

The scan tool displays Applied, Released or Invalid. The state of the BPP signal as determined by the ECM.

Ignition 1 Signal

The scan tool displays 0 to 25.5 Volts. The ECM/PCM monitors the voltage of the ignition 1 voltage circuit.

Initial Brake Apply Signal

The scan tool displays Applied or Released. The PCM monitors the signal circuit of the brake pedal position sensor.

Moderate Brake Apply Signal

The scan tool displays Applied or Released. The PCM monitors the signal circuit of the brake pedal position sensor.

Reduced Engine Power

The scan tool displays Yes or No. When the ECM detects that a reduced engine power condition exists, the scan tool displays Yes.

Stoplamp Pedal Switch

The scan tool displays Applied or Released. The PCM monitors the stop lamp pedal switch signal circuit. An activated brake pedal is displayed as Applied.

Stoplamp Pedal Switch Signal

The scan tool displays Volts. The PCM monitors the voltage of the stop lamp pedal switch signal circuit.

TAC/PCM Communication Signal

The scan tool displays OK or Fault. The PCM uses the universal asynchronous receiver transmitter (UART) serial data circuit in order to communicate with the throttle actuator control (TAC) module. A malfunction in the UART serial data circuit is displayed as Fault.

TAC Stoplamp Pedal Switch

The scan tool displays Applied or Released. The TAC module monitors the stop lamp pedal switch signal circuit. An activated brake pedal is displayed as Applied.

TAC Vehicle Speed Signal

The scan tool displays OK or Fault. The TAC module monitors the vehicle speed signal circuit. A malfunction in the vehicle speed signal circuit is displayed as Fault.

Traction Control Status

The scan tool displays Active or Inactive. When the PCM detects that a traction control condition exists, the scan tool displays Active.

Vehicle Speed Circuit History

The scan tool displays OK/Open/Short/Invalid State. The PCM detects and determines the history of the vehicle speed circuit.

Vehicle Speed Circuit Status

The scan tool displays OK/Fault/Invalid State. When the PCM detects that a malfunction in the vehicle speed signal circuit exists, the scan tool will display Fault or Invalid State.

Vehicle Speed Sensor

The scan tool displays 0-255 km/h (0-155 mph). The ECM/PCM monitors the vehicle speed sensor signal in order to calculate the vehicle speed for display.

DTC B3794

Circuit Description

The cruise control switch is an input to the body control module (BCM). The BCM monitors the cruise control set/coast and resume/accelerate switch signal circuit in order to detect when the driver has requested to perform a cruise control function. The BCM detects a specific voltage signal on the cruise control set/coast and resume/accelerate switch signal circuit when a switch is applied.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC B3794 Cruise Control Function Request Circuit

This vehicle has DTCs which include DTC Symptoms. For more information on DTC Symptoms, refer to **DTC Symptom Description** .

DTC B3794

DTC Symptom	DTC Symptom Descriptor
08	Signal Invalid
61	Actuator Stuck

Conditions for Running the DTC

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- The cruise switch is ON.
- The ignition is ON.

Conditions for Setting the DTC

- The BCM detects an invalid voltage signal on the cruise control + RES switch and - SET switch signal circuit.
- The above condition is present for 0.5 second.

Action Taken When the DTC Sets

- The BCM stores the DTC information into memory when the diagnostic runs and fails.
- The malfunction indicator lamp (MIL) will not illuminate.
- The Cruise Control System is disabled.

Conditions for Clearing the DTC

- The DTC becomes history when the fault is no longer present.
- A History DTC clears after 100 malfunction free ignition cycles.
- The BCM receives a clear code command from the scan tool.

Diagnostic Aids

For an intermittent, refer to **Testing for Intermittent Conditions and Poor Connections** .

DTC B3794

Step	Action	Values	Yes	No
Schematic Reference: <u>Cruise Control Schematics</u>				
Connector End View Reference: <u>Master Electrical Component List</u>				
1	Did you perform the Diagnostic System Check - Vehicle?	-	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. With the scan tool, observe the Cruise Control Switch parameter in the Body and Accessories body control module (BCM) Data list.	-		

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Step	Action	Values	Yes	No
Schematic Reference:	Cruise Control Schematics		Go to Step 3	Go to Step 4
Connector End View Reference:	Master Electrical Component List			
1	1. Turn OFF the ignition. 2. Disconnect C1 of the multifunction switch. 3. Turn ON the ignition, with the engine OFF.	-	Go to Step 2	Go to Diagnostic System Check - Vehicle
3	4. With the scan tool, observe the Cruise Control Switch parameter in the Body and Accessories BCM Data list. Does the Cruise Control Switch parameter display Error?	-	Go to Step 9	Go to Step 11
4	1. Turn the cruise control On/Off control switch ON. 2. With the scan tool, observe the Cruise Control Switch parameter in the Body and Accessories BCM Data list. Does the Cruise Control Switch parameter display Error?	-	Go to Step 7	Go to Step 5
5	1. Activate the cruise control set/coast switch. 2. With the scan tool, observe the Cruise Control Switch parameter in the Body and Accessories BCM Data list. Does the Cruise Control Switch parameter display Error?	-	Go to Step 7	Go to Step 6
6	1. Activate the cruise control resume/accel switch. 2. With the scan tool, observe the Cruise Control Switch parameter in the Body and Accessories BCM Data list. Does the Cruise Control Switch	-		Go to Diagnostic

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	Installed display Error?		Go to Step 7	Go to Step 7
	<p>IMPORTANT Turn OFF the ignition.</p> <p>1. Disconnect C-1 of the multifunction switch.</p> <p>2. The cruise control on/off switch must be turned ON in order to correctly view the set/coast switch resistance values with the DMM.</p> <p>3. Turn ON the ignition, with the engine OFF.</p> <p>1. Turn OFF the ignition.</p> <p>4. With the scan tool, observe the Cruise Control Switch resistance of the cruise control switch between the Accessories BCM Data list.</p> <p>2. With a DMM, measure the resistance of the cruise control switch between the ignition 1 voltage circuit and the cruise control set/coast and resume/accelerate switch parameter display Error?</p>	-	Go to Step 7	Go to Step 7
3		Off = O.L. On = 7.8 K-8.6 K Resume = 2.7 K-3.0 K	Go to Step 9	Go to Step 11
7		Set = 1.2 K-1.3 K		
	<p>1. Turn the cruise control On/Off control switch ON.</p> <p>3. Individually activate and hold the cruise control function switches while measuring the resistance parameter in the Body and Accessories BCM Data list.</p> <p>2. With the scan tool, observe the function switch.</p> <p>Does the Cruise Control Switch parameter display Error?</p>	-	Go to Step 7	Go to Step 7
4			Go to Step 7	Go to Step 7
	<p>1. Activate the cruise control set/coast switch.</p> <p>2. Test the ignition 1 voltage circuit for a high resistance. Refer to Circuit Testing and Wiring Repairs.</p> <p>3. With the scan tool, observe the parameter in the Body and Accessories BCM Data list.</p> <p>Did you find and correct the condition?</p> <p>Does the Cruise Control Switch parameter display Error?</p> <p>Test the cruise control set/coast and resume/accel switch signal</p>	-	Go to Step 8	Go to Step 11
8			Go to Step 15	Go to Step 10
			Go to Step 7	Go to Step 7
9	<p>circuit for a short to voltage. Refer to Circuit Testing and Wiring Repairs.</p> <p>Did you find and correct the condition?</p> <p>Test the cruise control set/coast and resume/accel switch signal circuit for a high resistance. Refer to Circuit Testing and Wiring Repairs.</p>	-	Go to Step 15	Go to Step 12
10		-		

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	<p>Repairs. the cruise control Did you complete the repair? Inspect for poor connections at C1</p>		Go to Step 15 Go to Step 7	Go to Step 12 Diagnostic Aids
11	<p>IMPORTANT function switch. Refer to Testing and Wiring Conditions and Poor Connections and Connector Repairs. The Testing and Wiring Conditions and Poor Connections and Connector Repairs must be turned ON in order to correctly view the set/coast switch resistance values with the DMM.</p>	-	Go to Step 15	Go to Step 13
12	<p>1. Turn OFF the ignition. 2. With a DMM, measure the resistance of the cruise control harness connector of the BCM switch between the Ignition 1 voltage circuit and the cruise control set/coast and resume/accelerate switch signal circuit. Inspect for poor connections at the harness connector of the BCM switch between the Ignition 1 voltage circuit and the cruise control set/coast and resume/accelerate switch signal circuit. Did you find and correct the condition? 3. Individually activate and hold the cruise control function switches while measuring the resistance value of each cruise control function switch. Replace the cruise control switch. Refer to Turn Signal Multifunction Switch Replacement. Did you complete the replacement? With resistance values measure Replace the BCM if needed?</p>	<p>Off = O.L. On = 7.8 K-8.6 K Resume = 2.7 K-3.0 K Set = 1.2 K-1.3 K</p>	Go to Step 15	Go to Step 14
13	<p>Control Module References for replacement setup and programming. Refer to Turn Signal Multifunction Switch Replacement. Did you complete the replacement? Did you find and correct the condition? 1. Use the scan tool in order to</p>	-	Go to Step 15 Go to Step 8	Go to Step 11
14 8	<p>Test the cruise control set/coast and resume/accel switch signal circuit for a short to voltage. Refer to Turn Signal Multifunction Switch Replacement. Did you find and correct the condition? 2. Operate the vehicle within the Conditions for Running the DTC.</p>	-	Go to Step 15 Go to Step 15	Go to Step 10
15 9	<p>Test the cruise control set/coast and resume/accel switch signal circuit for a short to voltage. Refer to Turn Signal Multifunction Switch Replacement. Did you find and correct the condition?</p>	-	Go to Step 15 Go to Step 15	Go to Step 10

DTC P0575

Circuit Description

When a cruise control function switch is activated, the body control module (BCM) detects a predetermined voltage signal. The BCM sends a GMLAN serial data message to the engine control module (ECM) indicating the function that has been requested.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC P0575 Cruise Control Switch Signal Circuit**Conditions for Running the DTC**

The engine is ON.

Conditions for Setting the DTC

- The ECM receives an invalid cruise control switch status GMLAN serial data message from the BCM.
- This diagnostic runs continuously.

Action Taken When the DTC Sets

- The Cruise Control System is disabled.
- The ECM stores the DTC information into memory when the diagnostic runs and fails.
- The malfunction indicator lamp (MIL) will not illuminate.
- The ECM records the operating conditions at the time the diagnostic fails. The ECM stores this information in the Failure Records.
- All cruise control function switches are set to OFF.

Conditions for Clearing the DTC

- A last test failed or the current DTC, clears when the diagnostic runs and does not fail.
- A history DTC clears after 40 consecutive warm-up cycles, if failures are not reported by this or any other emission related diagnostic.
- Use the scan tool in order to clear the DTC.

Diagnostic Aids

- This DTC may be stored as a history DTC without affecting the operation of the BCM. If stored only as a history DTC and not retrieved as a current DTC, do not replace the BCM.
- If this DTC is retrieved as both a current and history DTC, replace the BCM.

DTC P0575

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Step	Action	Yes	No
Schematic Reference: <u>Cruise Control Schematics</u>			
Connector End View Reference: <u>Computer/Integrating Systems Connector End Views</u>			
1	Did you perform the Diagnostic System Check - Vehicle?		Go to <u>Diagnostic System Check - Vehicle</u>
2	Is DTC P0575 current in the engine control module (ECM)?	Go to Step 2	Go to Diagnostic Aids
3	Replace the body control module (BCM). Refer to <u>Control Module References</u> for replacement, setup and programming.		-
	Did you complete the replacement?	Go to Step 4	
4	1. Use the scan tool in order to clear the DTCs. 2. Operate the vehicle within the Conditions for Running the DTC.		
	Does the DTC reset?	Go to Step 2	System OK

DTC P0608**Circuit Description**

The vehicle speed signal circuit is an input to the throttle actuator control (TAC) module from the powertrain control module (PCM). The PCM provides a constant voltage signal on the vehicle speed signal circuit. The PCM creates the vehicle speed signal by internally pulsing the vehicle speed signal to ground. The TAC module uses the vehicle speed signal from the PCM, in order to determine the vehicle speed. The TAC module then sends a universal asynchronous receiver transmitter (UART) serial data message to the PCM indicating the vehicle speed that the TAC module has detected.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC P0608 Vehicle Speed Output Circuit

Conditions for Running the DTC

- The vehicle is in Drive or Reverse.

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- The vehicle speed is greater than 8 km/h (5 mph).
- There are no VSS DTCs present in the PCM.
- The ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

- The PCM sends a 8 km/h (5 mph) signal on the vehicle speed signal circuit to the TAC module. The TAC module sends a UART serial data message to the PCM indicating that the vehicle speed is 0 km/h (0 mph).
- The condition must be present for greater than 4 seconds.

Action Taken When the DTC Sets

- The cruise control system is disabled.
- The PCM stores a DTC P0608 in memory.
- The PCM records the operating conditions at the time the DTC sets. The PCM displays the failure information in the Failure Records on the scan tool.

Conditions for Clearing the DTC

- The history DTC clears after 40 malfunction free warm-up cycles.
- The DTC becomes history when the conditions for setting the DTC are no longer present.
- The PCM receives the clear code command from the scan tool.

Diagnostic Aids

- If any additional powertrain DTCs are stored, refer to **Diagnostic Trouble Code (DTC) List - Vehicle** .
- For intermittent diagnosis, refer to **Testing for Intermittent Conditions and Poor Connections** .

DTC P0608

Step	Action	Value(s)	Yes	No
Schematic Reference: <u>Cruise Control Schematics</u> Connector End View Reference: <u>Powertrain Control Module Connector End Views</u>				
1	Did you perform the Diagnostic System Check - Vehicle?	-	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
	1. Turn OFF the ignition.			

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2	<ol style="list-style-type: none"> 2. Install a scan tool. 3. Raise the vehicle drive wheels. Refer to <u>Lifting and Jacking the Vehicle</u> . 4. Start the engine. 5. Place the transmission into drive. 6. With a scan tool, observe the Vehicle Speed Sensor parameter in the Body and Accessories, Cruise Control data list. 	-		
3	<p>Does the Vehicle Speed Sensor parameter indicate any vehicle speed?</p> <p>Is DTC P0502 or P0503 current in the PCM?</p>	-	<p>Go to Step 4</p> <p>Go to Diagnostic Aids</p>	<p>Go to Step 3</p> <p>Go to Step 7</p>
4	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect the throttle actuator control (TAC) module. 3. Turn ON the ignition, with the engine OFF. 4. Measure the voltage from the vehicle speed signal circuit to a good ground. 	8.5 V		
5	<p>Does the voltage measure greater than the specified value?</p> <p>Test the vehicle speed signal circuit for a short to voltage. Refer to <u>Circuit Testing</u> and to <u>Wiring Repairs</u> .</p> <p>Did you find and correct the condition?</p>	-	<p>Go to Step 5</p> <p>Go to Step 11</p>	<p>Go to Step 6</p> <p>Go to Step 8</p>
	Test the vehicle speed signal			

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Step	Action	Value(s)	Yes	No
Schematic Reference: Cruise Control Schematics Connector End View Reference: Powertrain Control Module Connector End View				
1	<p>1. Did you perform the Diagnostic System Check - Vehicle?</p> <p>Inspect for poor connections at the harness connector of the</p>	-	<p>Go to Step 11</p> <p>Go to Step 2</p>	<p>Go to Diagnostic System Check - Vehicle</p>
7	<p>PCM. Refer to Testing for Intermittent Conditions and Poor Connections and to Connector Repairs.</p> <p>1. Turn OFF the ignition.</p> <p>2. Install a scan tool.</p> <p>3. Drive the vehicle.</p> <p>4. Did you find and correct the condition?</p> <p>5. Inspect for poor connections at the harness connector of the TAC module. Refer to Testing for Intermittent Conditions and Poor Connections and to Connector Repairs.</p> <p>6. With a scan tool, observe the Vehicle Speed Sensor parameter in the Body and Accessories, Cruise Control data list.</p> <p>7. Replace the PCM. Refer to Control Module References for replacement, setup and programming.</p>	-	<p>Go to Step 11</p>	<p>Go to Step 9</p>
2		-		
8		-		
9	<p>8. Does the Vehicle Speed Sensor parameter indicate any vehicle speed?</p>	-	<p>Go to Step 11</p> <p>Go to Step 4</p>	<p>Go to Step 10</p> <p>Go to Step</p>
3	<p>9. Did you complete the replacement?</p> <p>Is DTC P0502 or P0503 current in the PCM?</p> <p>Replace the TAC module.</p>	-	<p>Go to Step 11</p> <p>Go to Diagnostic Aids</p>	<p>-</p> <p>Go to Step</p>
10	<p>Refer to Control Module References for replacement, setup and programming.</p> <p>1. Turn OFF the ignition.</p> <p>2. Disconnect the throttle actuator control (TAC) module.</p> <p>3. Did you complete the replacement?</p>	-	<p>Go to Step 11</p>	
4		8.5 V		-
11	<p>3. Turn ON the ignition, with the engine OFF.</p> <p>1. Use the scan tool in order to clear the DTCs.</p> <p>4. Measure the voltage from the vehicle speed signal within the Conditions for Running the DTC.</p>	-		
	Does the DTC reset?		Go to Step 2	System OK

DTC P0703**Circuit Description**

The body control module (BCM) monitors the brake pedal position sensor. When the brake pedal is applied, the BCM detects a predetermined voltage signal. The BCM sends a GMLAN serial data message to the powertrain control module (PCM) indicating the status of the stop lamps.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC P0703 Brake Switch Circuit 2

Conditions for Running the DTC

The engine is ON.

Conditions for Setting the DTC

- The PCM receives an invalid brake pedal status GMLAN serial data message from the BCM.
- This diagnostic runs continuously.

Action Taken When the DTC Sets

- The Cruise Control System is disabled.
- The PCM stores the DTC information into memory when the diagnostic runs and fails.
- The malfunction indicator lamp (MIL) will not illuminate.
- The PCM records the operating conditions at the time the diagnostic fails. The PCM stores this information in the Failure Records.

Conditions for Clearing the DTC

- A last test failed or the current DTC, clears when the diagnostic runs and does not fail.
- A history DTC clears after 40 consecutive warm-up cycles, if failures are not reported by this or any other emission related diagnostic.
- Use the scan tool in order to clear the DTC.

Diagnostic Aids

- If a BCM has been replaced, the brake pedal position (BPP) sensor must be calibrated. Refer to **Brake Pedal Position Sensor Calibration**.
- Repair any Brake System related DTCs before performing this diagnostic table.

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- This DTC may be stored as a history DTC without affecting the operation of the BCM. If stored only as a history DTC and not retrieved as a current DTC, do not replace the BCM.
- If this DTC is retrieved as both a current and a history DTC, replace the BCM.
- For an intermittent condition, refer to **Testing for Intermittent Conditions and Poor Connections** .

Test Description

The numbers below refer to the step numbers located in the diagnostic table.

2: This step is performed in order to confirm that DTC P0703 is current within the PCM.

3: This step is performed in order to correct a BPP sensor that must be calibrated, possibly due to a BCM replacement or for a BPP sensor that is out of adjustment.

DTC P0703

Step	Action	Yes	No
Schematic Reference: <u>Cruise Control Schematics</u> Connector End View Reference: <u>Computer/Integrating Systems Connector End Views</u>			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	Is DTC P0703 current in the powertrain control module (PCM)?	Go to Step 3	Go to Diagnostic Aids
3	1. Perform the brake pedal position (BPP) sensor calibration procedure. Refer to <u>Brake Pedal Position Sensor Calibration</u> . 2. Use the scan tool in order to clear the DTCs. 3. Operate the vehicle within the Conditions for Running the DTC.		
	Does the DTC reset?	Go to Step 4	System OK
4	Inspect for poor connections at the harness connector of the body control module (BCM). Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and to <u>Connector</u>		

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Step	Repairs . Action	Yes	No
Schematic	Did you find and correct the condition?	Go to Step 6	Go to Step 5
Connector	End View Reference From Connector/Integrating Systems Connector End		
Views	Module References for replacement,		
1	Setup and programming Diagnostic System Did you complete the replacement?	Go to Step 6	Go to Diagnostic System Check
6	1. Use the scan tool in order to clear the DTCs. 2. Operate the vehicle within the Conditions for Running the DTC.		
	Does the DTC reset?	Go to Step 2	System OK

DTC P1574

Circuit Description

The stop lamp switch signal circuit is a direct hardwire input to the throttle actuator control (TAC) module from the body control module (BCM). The TAC module monitors the stop lamp switch signal circuit in order to detect when the brake pedal has been applied. When the brake pedal is pressed, the BCM sends a GMLAN serial data message to the powertrain control module (PCM) indicating that the brake pedal has been applied. The BCM also sends a high voltage signal on the stop lamp switch signal circuit to the TAC module. The TAC module sends a universal asynchronous receiver transmitter (UART) serial data message to the PCM indicating that a brake pedal application has occurred. The PCM will compare the UART serial data message and the GMLAN serial data message in order to confirm that both serial data messages match.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC P1574 Stop Lamp Switch Circuit

Conditions for Running the DTC

- DTC P0573 is not set.
- The engine speed is greater than 700 RPM.
- The Traction Control System or the Antilock Brake System are not active and have not failed.
- The vehicle speed is greater than 48 km/h (30 mph) in order to enable the diagnostic.

The diagnostic will disable when the wheel speed is less than 16 km/h (10 mph).

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Conditions for Setting the DTC

- The PCM detects that there is a 4.2 km/h (2.6 mph) or greater decrease in vehicle speed within 0.25 second.
- The TAC module does not detect a voltage signal on the stop lamp switch signal circuit.

Action Taken When the DTC Sets

- The cruise control system is disabled.
- The PCM stores the DTC information into memory when the diagnostic runs and fails.
- The malfunction indicator lamp (MIL) will not illuminate.
- The PCM records the operating conditions at the time the diagnostic fails. The PCM stores this information in the Failure Records.

Conditions for Clearing the MIL/DTC

- A last test failed or the current DTC, clears when the diagnostic runs and does not fail.
- A history DTC clears after 40 consecutive warm-up cycles, if failures are not reported by this or any other emission related diagnostic.
- Use a scan tool in order to clear the MIL/DTC.

Diagnostic Aids

- Inspect for proper operation of the stop lamps. Refer to **Exterior Lighting Systems Description and Operation** .
- For an intermittent condition, refer to **Testing for Intermittent Conditions and Poor Connections** .

DTC P1574

Step	Action	Yes	No
Schematic Reference: <u>Cruise Control Schematics</u> Connector End View Reference: <u>Powertrain Control Module Connector End Views</u>			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	Is DTC P0573 current in the powertrain control module (PCM)?	Go to DTC P0573	Go to Step 3
3	Do the stop lamps operate properly?	Go to Step 4	Go to <u>Stop Lamps Malfunction</u>

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4	With a scan tool, observe the TAC Stop Lamp Pedal Switch parameter in the PCM Data, data list. Does the TAC Stop Lamp Pedal Switch parameter display Applied?	Go to Step 5	Go to Diagnostic Aids
5	Test the stop lamp switch signal circuit for an open or for a high resistance. Refer to <u>Circuit Testing</u> and <u>Wiring Repairs</u> . Did you find and correct the condition?	Go to Step 8	Go to Step 6
6	Inspect for poor connections at the harness connector of the throttle actuator control (TAC) module. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and to <u>Connector Repairs</u> . Did you find and correct the condition?	Go to Step 8	Go to Step 7
7	Replace the TAC module. Refer to <u>Control Module References</u> for replacement, setup and programming. Did you complete the replacement?	Go to Step 8	-
8	1. Use the scan tool in order to clear the DTCs. 2. Operate the vehicle within the Condition for Running the DTC. Does the DTC reset?	Go to Step 2	System OK

DTC P2162

Circuit Description

The vehicle speed signal circuit is an input to the throttle actuator control (TAC) module from the powertrain control module (PCM). The PCM provides a constant voltage signal on the vehicle speed signal circuit. The PCM creates the vehicle speed signal by internally pulsing the vehicle speed signal to ground. The TAC module uses the vehicle speed signal from the PCM, in order to determine the vehicle speed. The TAC module then sends a universal asynchronous receiver transmitter (UART) serial data message to the PCM indicating the vehicle speed that the TAC module has detected.

DTC Descriptor

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This diagnostic procedure supports the following DTC:

DTC P2162 Vehicle Speed Sensor (VSS) Circuit 1-2 Correlation

Conditions for Running the DTC

- The vehicle is in Drive or Reverse.
- The vehicle speed is greater than 8 km/h (5 mph).
- There are no VSS DTCs present in the PCM.
- The ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

- The PCM sends a 8 km/h (5 mph) signal on the vehicle speed signal circuit to the TAC module. The TAC module sends a UART serial data message to the PCM indicating that the vehicle speed is 0 km/h (0 mph).
- The condition must be present for greater than 4 seconds.

Action Taken When the DTC Sets

- The Cruise Control System is disabled.
- The PCM stores a DTC P2162 in memory.
- The PCM records the operating conditions at the time the DTC sets. The PCM displays the failure information in the Failure Records on the scan tool.

Conditions for Clearing the DTC

- The history DTC clears after 40 malfunction free warm-up cycles.
- The DTC becomes history when the conditions for setting the DTC are no longer present.
- The PCM receives the clear code command from the scan tool.

Diagnostic Aids

For intermittent diagnosis, refer to **Testing for Intermittent Conditions and Poor Connections** .

DTC P2162

Step	Action	Yes	No
Schematic Reference: <u>Cruise Control Schematics</u> Connector End View Reference: <u>Master Electrical Component List</u>			
1	Did you perform the Diagnostic System Check - Vehicle?		Go to <u>Diagnostic System Check -</u>

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		Go to Step 2	<u>Vehicle</u>
2	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Install a scan tool. 3. Raise the vehicle drive wheels. Refer to <u>Lifting and Jacking the Vehicle</u> . 4. Start the engine. 5. Place the transmission into drive. 6. With a scan tool, observe the Vehicle Speed Sensor parameter in the Body and Accessories, Cruise Control data list. 		
3	<p>Does the Vehicle Speed Sensor parameter indicate any vehicle speed?</p> <p>Is DTC P0502 or P0503 current in the powertrain control module (PCM)?</p>	<p>Go to Step 4</p> <p>Go to <u>DTC P0502</u> or <u>DTC P0503</u></p>	<p>Go to Step 3</p> <p>Go to Step 5</p>
4	<p>Test the vehicle speed signal circuit for the following:</p> <ul style="list-style-type: none"> • A short to ground • An open • A high resistance <p>Refer to <u>Circuit Testing</u> and to <u>Wiring Repairs</u> .</p> <p>Did you find and correct the condition?</p>	Go to Step 9	Go to Step 6
5	<p>Inspect for poor connections at the harness connector of the PCM. Refer to <u>Testing for Intermittent Conditions and Poor Connections</u> and <u>Connector Repairs</u> .</p> <p>Did you find and correct the condition?</p>	Go to Step 9	Go to Step 7
	Inspect for poor connections at the harness connector of the throttle actuator control (TAC) module. Refer		

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Step	to Testing for Intermittent	Yes	No
Schematic Reference Connector End View Master Electrical Component List			
1	Did you find and correct the condition? Vehicle? Replace the PCM. Refer to Control Module References for replacement,	Go to Step 9	Go to Step 8
7	setup and programming. Turn OFF the ignition. Did you complete the replacement? 2. Install a scan tool. Replace the TAC module. Refer to Control Module References for replacement, setup and programming.	Go to Step 2	Diagnostic System Check Vehicle
8	3. Raise the vehicle drive wheels. Refer to Lifting and Jacking the Vehicle .	Go to Step 9	-
2	Did you complete the replacement? 4. Start the engine. 1. Use the scan tool in order to place the DTCs.	Go to Step 9	-
9	5. Place the transmission into drive. 6. Operate the vehicle within the Conditions for Running the DTC. Does the DTC reset?	Go to Step 2	System OK

SYMPTOMS - CRUISE CONTROL

IMPORTANT: The following steps must be completed before using the symptom tables.

- Perform the **Diagnostic System Check - Vehicle** , before using the Symptom Tables in order to verify that all of the following are true:
 - There are no DTCs set.
 - The control modules can communicate via the serial data link.
- Review the system operation in order to familiarize yourself with the system functions. Refer to **Cruise Control Description and Operation (3.8L)** or **Cruise Control Description and Operation (4.6L)**.

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the Cruise Control System. Refer to **Checking Aftermarket Accessories** .
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to **Testing for Intermittent Conditions and Poor Connections** .

Symptom List

Refer to **Cruise Control Inoperative/Malfunctioning**.

CRUISE CONTROL SWITCH INDICATOR ALWAYS ON

Diagnostic Aids

- Repair any brake system related DTCs before performing this diagnostic.
- If a BCM has been replaced, the brake pedal position (BPP) sensor must be calibrated. Refer to **Brake Pedal Position Sensor Calibration** .
- For an intermittent condition, refer to **Testing for Intermittent Conditions and Poor Connections** .

Cruise Control Switch Indicator Always On

Step	Action	Yes	No
Schematic Reference: <u>Cruise Control Schematics</u> Connector End View Reference: <u>Cruise Control Connector End Views</u>			
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	1. Turn the ignition OFF. 2. Disconnect the cruise control switch. 3. Connect a fused jumper between the voltage signal circuit and the low reference circuit. 4. Turn the ignition ON. 5. With the scan tool, observe the Cruise On/Off Switch parameter in the Engine Control Module Data. Does the Cruise On/Off Switch parameter display On?	Go to Step 5	Go to Step 3
3	Test the voltage signal circuit and the low reference circuit for an open or for a high resistance. Refer to <u>Circuit</u>		

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4	Testing and Wiring Repairs . Did you find and correct the condition? Inspect for poor connections at the harness connector of the body control module (BCM). Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs .	Go to Step 7	Go to Step 4
	Did you find and correct the condition?	Go to Step 7	Go to Step 6
5	Replace the cruise control switch. Refer to Turn Signal Multifunction Switch Replacement .		
	Did you complete the replacement?	Go to Step 7	-
6	Replace the BCM. Refer to Control Module References for replacement, setup and programming.		
	Did you complete the replacement?	Go to Step 7	-
7	Operate the system in order to verify the repair.		
	Does the system operate properly?	System OK	Go to Step 2

CRUISE CONTROL INOPERATIVE/MALFUNCTIONING

Diagnostic Aids

In order to avoid misdiagnosis, inspect for the following:

- Ensure that the following cruise control switches are not stuck in the engaged position:
 - On/Off switch
 - Set/Coast switch
 - Resume/Accel switch
- Proper operation of the brake lamps - Refer to **Exterior Lighting Systems Description and Operation** .

For an intermittent condition, refer to **Testing for Intermittent Conditions and Poor Connections** .

Conditions for Enabling Cruise Control

- The vehicle speed is greater than 40 km/h (25 mph).
- The vehicle is not in PARK, REVERSE, NEUTRAL or 1st gear.
- The system voltage is within 9-16 volts.
- The park brake is not applied.

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Test Description

The number below refers to the step number on the diagnostic table.

6: This step tests the ignition 1 voltage circuit for an open, for a short to ground or for a high resistance.

Cruise Control Inoperative/Malfunctioning

Step	Action	Values	Yes	No
Schematic Reference: <u>Cruise Control Schematics</u> Connector End View Reference: <u>Master Electrical Component List</u>				
1	Did you perform the Diagnostic System Check - Vehicle?	-	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. With the scan tool, observe the Cruise Control Switch parameter in the Body and Accessories body control module (BCM) Data list. Does the Cruise Control Switch parameter display Off?	-	Go to Step 3	Go to Step 7
3	1. Turn the cruise control On/Off switch ON. 2. With the scan tool, observe the Cruise Control Switch parameter. Does the Cruise Control Switch parameter display On?	-	Go to Step 4	Go to Step 6
4	1. Turn the cruise control on/off switch ON. 2. With the scan tool, observe the Cruise Control Switch parameter. 3. Press and hold the cruise			

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5	<p>control set/coast button.</p> <p>Does the Cruise Control Switch parameter display Set?</p> <ol style="list-style-type: none"> 1. With the scan tool, observe the Cruise Control Switch parameter. 2. Press and hold the resume/accel switch. <p>Does the Cruise Control Switch parameter Display Resume?</p>	-	<p>Go to Step 5</p> <p>Go to Diagnostic Aids</p>	<p>Go to Step 8</p> <p>Go to Step 8</p>
6	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect C1. 3. Turn ON the ignition, with the engine OFF. 4. Connect a test lamp between the ignition 1 voltage circuit and a good ground. <p>Does the test lamp illuminate?</p>	-	<p>Go to Step 8</p>	<p>Go to Step 13</p>
7	<p>IMPORTANT: The cruise control on/off switch must be turned ON in order to correctly view the set/coast switch resistance values with the DMM.</p> <ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect C1. 3. With a DMM, measure the resistance of the cruise control switch between the ignition 1 voltage circuit and the cruise control set/coast and resume/accelerate switch signal circuit. 4. Individually activate and hold the cruise control function switches while measuring the resistance value of each cruise control function switch. 	<p>Off = O.L. On = 7.8 K-8.6 K Resume = 2.7 K-3.0 K Set = 1.2 K-1.3 K</p>		

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Step	Do the cruise control function	Values	Yes	No
Schematic Reference: <u>Cruise Control Schematics</u>	Action: Switch resistance values meet SRB between the specified values?		Go to Step 10	Go to Step 11
Connector View Reference: <u>Master Electrical Component List</u>				
1	IMPORTANT: Do you perform the Diagnostic System Check - Vehicle? The cruise control on/off switch must be turned ON in order to correctly view the set/coast switch resistance values with the DMM.	-	Go to Step 2	Go to Diagnostic System Check - Vehicle
2 8	<ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Disconnect C1. 3. With the DMM, measure the resistance of the cruise control switch between the ignition 1 voltage circuit and the cruise control set/coast and resume/accelerate switch signal circuit. <p>Does the Cruise Control Switch parameter display Off?</p>	Off = O.L. On = 7.8 K-8.6 K Resume = 2.7 K-3.0 K Set = 1.2 K-1.3 K -	Go to Step 3	Go to Step 3
3	<ol style="list-style-type: none"> 1. Turn the cruise control On/Off switches while measuring the resistance value of each cruise control function switch. 2. With the scan tool, observe the Cruise Control Switch parameter. <p>Do the cruise control function switch resistance values measure between the specified values?</p>		Go to Step 9	Go to Step 11
	Does the Cruise Control Switch parameter display On?	-	Go to Step 4	Go to Step 4
9	<ol style="list-style-type: none"> 1. Turn the cruise control on/off circuit for the following. 2. With the scan tool, observe the Cruise Control Switch parameter. <ul style="list-style-type: none"> • Short to ground • Short to voltage <p>Refer to Circuit Testing and Wiring Repairs.</p> <p>Did you find and correct the condition?</p>	-	Go to Step 16	Go to Step 12
	Test the cruise control set/coast			

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4	and resume/accel switch signal circuit for a short to voltage. Refer to Circuit Testing and Wiring Repairs . Cruise Control Switch Did you find and correct the condition?	-	Go to Step 5	Go to Step 5
	1. With the scan tool, observe the Cruise Control Switch parameter. Inspect for poor connections at the harness connector of the cruise control switch. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs . Does the Cruise Control Switch parameter Display Resume?	-	16	12
5	1. Turn OFF the ignition. Inspect for poor connections at the harness connector of the BCM. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs . Connect a test lamp between the ignition 1 voltage circuit and a good ground. Did you find and correct the condition?	-	Go to Diagnostic Aids	Go to Step 14
11	1. Turn OFF the ignition. Inspect for poor connections at the harness connector of the BCM. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs . Connect a test lamp between the ignition 1 voltage circuit and a good ground. Did you find and correct the condition?	-	16	14
12	1. Turn OFF the ignition. Inspect for poor connections at the harness connector of the BCM. Refer to Testing for Intermittent Conditions and Poor Connections and Connector Repairs . Connect a test lamp between the ignition 1 voltage circuit and a good ground. Did you find and correct the condition?	-	Go to Step 16	Go to Step 15
	Replace the BCM in the ignition	-	Go to Step 8	13
13	Important circuit: The cruise control on/off switch must be turned ON in order to correctly view the set/coast switch resistance values with the DMM. • A high resistance • A short to ground 1. Turn OFF the ignition. 2. Disconnect C1. 3. With a DMM, measure the resistance of the cruise control switch between the ignition 1 voltage circuit and the cruise control set/coast and resume/accelerate switch signal circuit. Did you complete the repair?	Off = O.L. On = 7.8 K-8.6 K Resume = 2.7 K-3.0 K Set = 1.2 K-1.3 K	Go to Step 16	-
7	Replace the cruise control switch. Refer to Turn Signal Multifunction Switch Replacement . Did you complete the replacement?	-	Go to Step 16	-
14	4. Individually activate and hold the BCM. Refer to Control Module References for replacement, setup and programming.	-	Go to Step 16	-
15			Go to Step	

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	Did you complete the replacement of the cruise control switches while measuring the resistance value of each cruise control function switch.	-	16	-
16	Operate the vehicle within the conditions for cruise control operation. Does the cruise control system operate properly?	-	System OK	Go to Step 2

DESCRIPTION AND OPERATION

CRUISE CONTROL DESCRIPTION AND OPERATION (3.8L)

Cruise control is a speed control system that maintains a desired vehicle speed under normal driving conditions at speeds above 40 km/h (25 mph). Steep grades may cause variations in the selected vehicle speeds.

The following are the main components of the Cruise Control System:

- The accelerator pedal
- The brake pedal position (BPP) sensor
- The body control module (BCM)
- The cruise control cancel switch
- The cruise control on/off switch
- The powertrain control module (PCM)
- The + RES switch-The + RES switch is the equivalent to an accel/resume switch.
- The - SET switch-The - SET switch is the equivalent to a set/coast switch.
- The throttle actuator control (TAC) module
- The TAC motor
- The vehicle speed sensor (VSS)

Cruise Control Engaged

The Cruise Control System will engage and adjust vehicle speeds, based on the activation of the following cruise control switches, which are located on the steering wheel:

- On/off
- + RES
- - SET

The body control module (BCM) monitors the signal circuit of the cruise control switches. The BCM relays the cruise control switch status to the powertrain control module (PCM) via the GMLAN serial data circuit. The PCM uses the status of the cruise control switch to determine

when to capture and maintain the vehicle speed. The PCM monitors the vehicle speed signal circuit in order to determine the desired vehicle speed. The PCM uses the throttle actuator control (TAC) module and the TAC motor in order to maintain the vehicle speed. For further information on the TAC system, refer to **Throttle Actuator Control (TAC) System Description**.

Voltage is supplied to the cruise control switch via the steering wheel control switch reference voltage circuit supplied by the BCM. The cruise control function switches are arranged in a resistive ladder design, with each cruise control function switch having a different resistance value. The BCM detects a specific voltage value that is associated with the cruise control function switch being activated. When the normally open cruise control on/off switch is turned ON, the switch closes and the BCM supplies a ground to the cruise control switch ON indicator circuit as it becomes illuminated. The BCM sends a GMLAN serial data message to the PCM indicating that the on/off switch is active. Similarly, when the normally open + RES switch or the normally open - SET switch are pressed, the switch closes and the BCM detects the predetermined voltage signal on the cruise control set/coast and resume/accel switch signal circuit. The BCM sends a GMLAN serial data message to the PCM indicating that the + RES switch or the - SET switch is active. To engage the Cruise Control System, ensure that the vehicle speed is above 40.2 km/h (25 mph), turn the cruise On/Off switch ON and momentarily press the - SET switch. The PCM will engage the Cruise Control System and record the vehicle speed. The PCM sends a GMLAN serial data message to the instrument panel cluster (IPC) in order to illuminate the Cruise Engaged indicator in the IPC. The - SET switch and the + RES switch will remain inactive when the BCM has not received the predetermined voltage signal from the on/off switch. Pressing the accelerator pedal, while the Cruise Control System is engaged, will allow the driver to override the Cruise Control System in order to accelerate the vehicle beyond the current set vehicle speed. When the accelerator pedal is released, the vehicle will decelerate and resume the current set vehicle speed. The driver can also override the current set vehicle speed via the - SET switch and the + RES switch. When the Cruise Control System is engaged, pressing and holding the - SET switch will allow the vehicle to decelerate from the current set vehicle speed without deactivating the Cruise Control System. When the - SET switch is released, the PCM will record the vehicle speed and maintain the vehicle speed as the new set vehicle speed. When the Cruise Control System is engaged, momentarily pressing the - SET switch will allow the vehicle to decelerate at 1.6 km/h (1 mph) increments for each time that the - SET is momentarily pressed, with a minimum vehicle speed of 37 km/h (23 mph). Pressing and holding the + RES switch, when the Cruise Control System is engaged, will allow the vehicle to accelerate to a greater vehicle speed than the current set vehicle speed. When the + RES switch is released, the PCM will record the vehicle speed and maintain the vehicle speed as the new set vehicle speed. When the Cruise Control System is engaged, momentarily pressing the + RES switch will allow the vehicle to accelerate at 1.6 km/h (1 mph) increments for each time that the + RES switch is momentarily pressed, with the maximum acceleration total of 16 km/h (10 mph) over the current set vehicle speed. Momentarily activating the + RES switch will recall the previous vehicle speed, after the cruise control system is disengaged by pressing the brake pedal or by

activating the CANCEL switch.

Cruise Control Disengaged

The powertrain control module (PCM) disengages the cruise control operation based on the signals from the following switches:

- The brake pedal position (BPP) sensor
- The cruise control cancel switch
- The cruise control on/off switch

The body control module (BCM) determines when the cruise control cancel switch is activated. When the normally open cancel switch is closed, the BCM detects the predetermined voltage signal on the cruise control function switch circuit. The BCM sends a GMLAN serial data message to the PCM in order to disengage the cruise control system.

The BPP sensor is mounted on the brake pedal bracket. Pressing the brake pedal while the cruise control is engaged will disengage the Cruise Control System. The body control module (BCM) monitors the BPP sensor via the BPP sensor signal circuit as the voltage signal increases while the pedal reaches the fully applied position. The BCM sends a GMLAN serial data message to the PCM indicating the position of the brake pedal. For further information on the BPP sensor, refer to **Exterior Lighting Systems Description and Operation** and **Brake Pedal Position Sensor Calibration**.

The Cruise Control System will disengage when the cruise control on/off switch is switched OFF.

The Cruise Control System will disengage when the PCM detects that a driver override function has been active for approximately 60 seconds.

When the Cruise Control System has been disengaged, the PCM sends a GMLAN serial message to the instrument panel cluster (IPC) in order to turn OFF the Cruise Engaged indicator.

The vehicle speed stored in the memory of the PCM will be erased when the cruise control on/off button is turned OFF or the ignition switch is turned OFF.

Cruise Control Inhibited

The powertrain control module (PCM) inhibits the cruise control operation when any of the following conditions exist:

- The PCM has not detected a brake pedal activation from the body control module (BCM).

- A Cruise Control System DTC has been set.
- The vehicle speed is less than 40.2 km/h (25 mph).
- The vehicle speed is too high.
- The vehicle is in PARK, REVERSE, NEUTRAL or 1st gear.
- The engine RPM is too low.
- The engine RPM is too high.
- The system voltage is not between 9-16 volts.
- The Antilock Brake System (ABS)/Traction Control System (TCS) is active for more than 2 seconds.

CRUISE CONTROL DESCRIPTION AND OPERATION (4.6L)

Cruise control is a speed control system that maintains a desired vehicle speed under normal driving conditions at speeds above 40 km/h (25 mph). Steep grades may cause variations in the selected vehicle speeds.

The following are the main components of the Cruise Control System:

- The accelerator pedal
- The brake pedal position (BPP) sensor
- The body control module (BCM)
- The cruise control cancel switch
- The cruise control on/off switch
- The engine control module (ECM)
- The + RES switch

The + RES switch is the equivalent to an accel/resume switch.

- The - SET switch

The - SET switch is the equivalent to a set/coast switch.

- The TAC motor
- The vehicle speed sensor (VSS)

Cruise Control Engaged

The Cruise Control System will engage and adjust vehicle speeds, based on the activation of the following cruise control switches, which are located on the steering wheel:

- On/off

- + RES
- - SET

The body control module (BCM) monitors the signal circuit of the cruise control switches. The BCM relays the cruise control switch status to the engine control module (ECM) via the GMLAN serial data circuit. The ECM uses the status of the cruise control switch to determine when to capture and maintain the vehicle speed. The ECM monitors the vehicle speed signal circuit in order to determine the desired vehicle speed. The ECM uses the TAC motor in order to maintain the vehicle speed. For further information on the TAC System, refer to **Throttle Actuator Control (TAC) System Description**.

Voltage is supplied to the cruise control switch via the steering wheel control switch reference voltage circuit supplied by the BCM. The cruise control function switches are arranged in a resistive ladder design, with each cruise control function switch having a different resistance value. The BCM detects a specific voltage value that is associated with the cruise control function switch being activated. When the normally open cruise control on/off switch is turned ON, the switch closes and the BCM supplies a ground to the cruise control switch ON indicator circuit as it becomes illuminated. The BCM sends a GMLAN serial data message to the ECM indicating that the on/off switch is active. Similarly, when the normally open + RES switch or the normally open - SET switch are pressed, the switch closes and the BCM detects the predetermined voltage signal on the cruise control set/coast and resume/accel switch signal circuit. The BCM sends a GMLAN serial data message to the ECM indicating that the + RES switch or the - SET switch is active. To engage the Cruise Control System, ensure that the vehicle speed is above 40.2 km/h (25 mph), turn the cruise On/Off switch ON and momentarily press the - SET switch. The ECM will engage the Cruise Control System and record the vehicle speed. The ECM sends a GMLAN serial data message to the instrument panel cluster (IPC) in order to illuminate the Cruise Engaged indicator in the IPC. The - SET switch and the + RES switch will remain inactive when the BCM has not received the predetermined voltage signal from the on/off switch. Pressing the accelerator pedal, while the Cruise Control System is engaged, will allow the driver to override the Cruise Control System in order to accelerate the vehicle beyond the current set vehicle speed. When the accelerator pedal is released, the vehicle will decelerate and resume the current set vehicle speed. The driver can also override the current set vehicle speed via the - SET switch and the + RES switch. When the Cruise Control System is engaged, pressing and holding the - SET switch will allow the vehicle to decelerate from the current set vehicle speed without deactivating the Cruise Control System. When the - SET switch is released, the ECM will record the vehicle speed and maintain the vehicle speed as the new set vehicle speed. When the Cruise Control System is engaged, momentarily pressing the - SET switch will allow the vehicle to decelerate at 1.6 km/h (1 mph) increments for each time that the - SET is momentarily pressed, with a minimum vehicle speed of 37 km/h (23 mph). Pressing and holding the + RES switch, when the Cruise Control System is engaged, will allow the vehicle to accelerate to a greater vehicle speed than the current set vehicle speed. When the + RES switch is released, the ECM will record the vehicle speed and maintain the vehicle speed as the new set vehicle speed. When the

Cruise Control System is engaged, momentarily pressing the + RES switch will allow the vehicle to accelerate at 1.6 km/h (1 mph) increments for each time that the + RES switch is momentarily pressed, with the maximum acceleration total of 16 km/h (10 mph) over the current set vehicle speed. Momentarily activating the + RES switch will recall the previous vehicle speed, after the cruise control system is disengaged by pressing the brake pedal or by activating the CANCEL switch.

Cruise Control Disengaged

The engine control module (ECM) disengages the cruise control operation based on the signals from the following switches:

- The brake pedal position (BPP) sensor
- The cruise control cancel switch
- The cruise control on/off switch

The body control module (BCM) determines when the cruise control cancel switch is activated. When the normally open cancel switch is closed, the BCM detects the predetermined voltage signal on the cruise control function switch circuit. The BCM sends a GMLAN serial data message to the ECM in order to disengage the cruise control system.

The BPP sensor is mounted on the brake pedal bracket. Pressing the brake pedal while the cruise control is engaged will disengage the Cruise Control System. The body control module (BCM) monitors the BPP sensor via the BPP sensor signal circuit as the voltage signal increases while the pedal reaches the fully applied position. The BCM sends a GMLAN serial data message to the ECM indicating the position of the brake pedal. For further information on the BPP sensor, refer to **Exterior Lighting Systems Description and Operation** and to **Brake Pedal Position Sensor Calibration**.

The Cruise Control System will disengage when the cruise control on/off switch is switched OFF.

The Cruise Control System will disengage when the ECM detects that a driver override function has been active for approximately 60 seconds.

When the Cruise Control System has been disengaged, the ECM sends a GMLAN serial message to the instrument panel cluster (IPC) in order to turn OFF the Cruise Engaged indicator.

The vehicle speed stored in the memory of the ECM will be erased when the cruise control on/off button is turned OFF or the ignition switch is turned OFF.

Cruise Control Inhibited

The engine control module (ECM) inhibits the cruise control operation when any of the following conditions exist:

- The ECM has not detected a brake pedal activation from the body control module (BCM).
- A Cruise Control System DTC has been set.
- The vehicle speed is less than 40.2 km/h (25 mph).
- The vehicle speed is too high.
- The vehicle is in PARK, REVERSE, NEUTRAL or 1st gear.
- The engine RPM is too low.
- The engine RPM is too high.
- The system voltage is not between 9-16 volts.
- The Antilock Brake System (ABS)/Traction Control System (TCS) is active for more than 2 seconds.

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